

VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Specification:

The paragraph beginning on page 7, line 21 and ending on page 7, line 27 has been amended as follows:

--The through hole 190 is useful during the process of molding the encapsulant material 194 about the package components. The through hole 190 permits passage of molten encapsulant material 194 from adjacent the first surface 186 of the ~~strap cover portion~~ 170 through the through hole 190 and into a region adjacent the second surface 188 of the ~~strap cover portion~~ 170. Permitting the molten encapsulant material 194 to pass through the hole 190 also helps prevent the strap 122 from being disconnected during the molding process. A portion of the encapsulant material 194 fills the through hole 190. --

The paragraph beginning on page 8, line 9 and ending on page 8, line 16 has been amended as follows:

-- The first surface 186 of the cover portion 170 around the through hole 190 is not covered by the encapsulant material 194, but is exposed in and substantially coplanar and flush with the first surface 196 of the encapsulant material 194. The first surface 186 of the cover portion 170 radiates heat effectively to the exterior, since the first surface 186 is not covered with the

encapsulant material 194. Such heat is typically generated at the die 102 and conducted through a thermal path including the flange portion 176 and the connection portion 174 of the strap 122 to the first surface 186 of the ~~strap 122 cover portion 170~~, where the heat may be dissipated ~~from the first surface 186~~, such as by radiation. --

The paragraph beginning on page 8, line 17 and ending on page 8, line 21 has been amended as follows:

-- Optionally, heat sink structures (not shown), including vertical protrusions, such as heat fins, heat pins, and the like may be attached to, or formed on, the first surface 186 of the ~~strap 122 cover portion 170~~ to provide additional heat dissipation capability to the package 100. The heat sink structures may be secured on the ~~strap~~ first surface 186 by a thermally conductive adhesive or thermal grease, for example. --

The paragraph beginning on page 9, line 11 and ending on page 9, line 15 has been amended as follows:

-- Accordingly, this embodiment provides for multiple thermal paths for dissipation of heat generated at the die 102. Heat may be dissipated through the following exposed surfaces: the first surface 186 of the ~~cover portion 170~~ of the strap 122, the second

surface 126 of the die pad 104, the second surfaces 136 of the leads 106, the second surface 146 of the lead 114, and the second surfaces 160 of the leads 116-120, among other possibilities. --

The paragraph beginning on page 9, line 23 and ending on page 10, line 4 has been amended as follows:

-- FIGS. 4-6 illustrate a semiconductor package 400 in accordance with another embodiment of the present invention. The semiconductor package 400 is similar to the semiconductor package 100 (FIGS. 1-3), and has common features, except as follows. Comparing FIGS. 4 and 5 to FIGS. 1 and 2, the first surface 186 of the ~~strap 122 cover portion 170~~ of package 400 is not exposed through the first surface 196 of the encapsulant material 194, but is encapsulated by the encapsulant material 194. Nonetheless, this embodiment provides for multiple thermal paths for dissipation of heat generated at the die 102. In this embodiment, heat may be dissipated through the following exposed surfaces: the second surface 126 of the die pad 104, the second surfaces 136 of the leads 106, the exposed surface 146 of the lead 114, and the second surfaces 160 of the leads 116-120. Of course, heat will also radiate through the thin layer of encapsulant material 194 over the first surface 186 of the cover portion 170 of the strap 122. --

The paragraph beginning on page 10, line 18 and ending on page 10, line 22 has been amended as follows:

-- Package 700 provides multiple thermal paths for dissipation of heat generated at the die 102. Heat may be dissipated through the following exposed surfaces: the first surface 186 (FIG. 8) of the cover portion 170 of the strap 122, the second surfaces 136 (FIG. 9) of the leads 106, the second surface 146 (FIG. 9) of the lead 114, and the second surfaces 160 (FIG. 9) of the leads 116, 118, and 120, among other possibilities. --

In the Claims:

Claims 1, 12, 21, 23, and 24 have been amended as follows:

1. (Amended) A semiconductor package, comprising:

a die;

a die pad having first and second surfaces, the die being mounted on the ~~die pad~~ first surface of the die pad;

a plurality of leads, each ~~lead~~ of the leads having first and second surfaces, with at least some of the leads being integrally connected to the die pad;

a conductive strap disposed extending between and electrically coupling the die and the first surfaces of at least some of the leads to electrically couple which are not integrally connected to the die and the leads pad;

an encapsulant material encapsulating the die, at least a portion of the die pad, at least a portion of the conductive strap, and at least a portion of the ~~lead~~ first surfaces, ~~of the leads~~ such that the second surfaces of the leads ~~being~~ are exposed ~~in a~~ plane of ~~within~~ and substantially flush with a horizontal exterior surface of the encapsulant material.

12. (Amended) A semiconductor package, comprising:

a die;

a die pad having first and second surfaces, the die being mounted on the ~~die pad~~ first surface ~~of the die pad~~;

a plurality of leads, each ~~lead of the leads~~ having first and second surfaces, with at least some of the leads being integrally connected to the die pad;

a conductive strap ~~disposed extending between and electrically coupling~~ the die and the first surfaces of at least some of the leads ~~to electrically couple which are not electrically connected to the die and the leads pad~~;

an encapsulant material encapsulating the die, at least a portion of the die pad, at least a portion of the strap, and at least a portion of the ~~lead~~ first surfaces, ~~of the leads~~ such that at least a portion of the strap is exposed through the encapsulant material, and at least a portion of the ~~second surface of the die pad and the second surface surfaces~~ of the leads are exposed ~~in a~~

plane of within and substantially flush with a horizontal exterior surface of the encapsulant material.

21. (Amended) A semiconductor package, comprising:

a die;

a die pad having first and second surfaces, the die being mounted on the ~~die pad~~ first surface of the die pad;

a plurality of leads, each ~~lead of the leads~~ having first and second surfaces, with at least some of the leads being integrally connected to the die pad;

a conductive strap disposed extending between and electrically coupling the die and the first surfaces of at least some of the leads to electrically couple which are not integrally connected to the die and ~~the leads~~ pad;

an encapsulant material encapsulating the die, at least a portion of the die pad, at least a portion of the conductive strap, and at least a portion of the ~~lead~~ first surfaces, of the leads such that the second surfaces of the leads being are exposed in a plane of within and substantially flush with a horizontal exterior surface of the encapsulant material;

each ~~lead of the leads~~ having a lead recessed portion adjacent to the exposed second surface thereof, wherein the encapsulant material fills the lead recessed portion portions;

the die pad having a die pad recessed portion adjacent to the

~~die pad~~ second surface thereof, the ~~die pad~~ recessed portion extending about the entire periphery of the ~~die pad~~ second surface of the die pad, wherein the encapsulant material fills the ~~die pad~~ recessed portion.

23. (Amended) A semiconductor package, comprising:

a die;

a die pad having first and second surfaces, the die being mounted on the ~~die pad~~ first surface of the die pad;

plurality of leads, each ~~lead~~ of the leads having first and second surfaces, with at least some of the leads being integrally connected to the die pad;

a conductive strap disposed extending between and electrically coupling the die and the first surfaces of at least some of the leads to electrically couple which are not integrally connected to the die and the leads pad;

an encapsulant material encapsulating the die, at least a portion of the die pad, at least a portion of the conductive strap, and at least a portion of the ~~lead~~ first surfaces, of the leads such that at least a portion of the strap is exposed through the encapsulant material and the second surfaces of the leads being are exposed in a plane of within and substantially flush with a horizontal exterior surface of the encapsulant material; and

a through hole formed in the exposed portion of the conductive

strap, the encapsulant material filling the through hole.

24. (Amended) A semiconductor package, comprising:

a PMOSFET die;

a die pad having first and second surfaces, the PMOSFET die being mounted on and electrically coupled to the ~~die pad~~ first surface of the die pad, wherein at least one source lead having first and second surfaces is integrally formed with the die pad;

a plurality of drain leads, each of the drain lead having first and second surfaces;

a conductive strap disposed between the PMOSFET die and the first surfaces of the drain leads to electrically couple the PMOSFET die and the drain leads;

a gate lead electrically coupled to the PMOSFET die;

an encapsulant material encapsulating the PMOSFET die, at least a portion of the die pad, at least a portion of the conductive strap, at least a portion of the first surface of the source lead, and at least a portion of the ~~drain lead~~ first surfaces, of the drain leads such that the second surfaces of the drain leads being and the second surface of the source lead are exposed in a plane of within and substantially flush with a horizontal exterior surface of the encapsulant material.

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